

Notice of Allowability

Application No.

09/651,871

Examiner

Lan Vinh

Applicant(s)

DONOHUE ET AL.

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Appealed brief filed on 11/24/2003.
2. ☒ The allowed claim(s) is/are 5-8, 10-27, 29-36, 38-46.
3. ☒ The drawings filed on 31 August 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

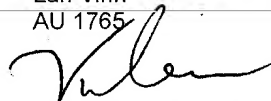
Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

Lan Vinh
AU 1765



Allowable Subject Matter

1. Claims 5-8, 10-27, 29-36 and 38-46 allowed.

The following is an examiner's statement of reasons for allowance:

Regarding claims 5, 41, the applicants have presented a persuasive argument (page 4 of the appealed brief) that the cited prior art of record fails to disclose a method to control etch profile while etching "wherein said pulsing is applied so that the at least one gas does not reach steady state concentration within an etch chamber in a plurality of periods/wherein said pulsing is applied so that the carbon containing gas does not reach steady state concentration within an etch chamber in a plurality of periods". In the contrary, the closest cited prior art of Kashimizu et al (US 5,980,767) discloses pulsing wherein the concentration of the gas within the etch chamber reaches steady state (the pulse is level either at least at its maximum or minimum) at least one in a given plurality of periods (fig. 51). Regarding claims 27, 31, 35, the applicants have presented a persuasive argument (page 5 of the appealed brief) that the cited prior art of record fails to disclose a method for etching oxide "wherein said hydrofluorocarbon gas is pulsed in a range from 0 sccm to about 25 sccm and is at least intermittently at a higher concentration than said fluorocarbons gas/wherein said second gas is at least intermittently at a higher concentration than said first gas/wherein said etchant gas is at least intermittently at a higher concentration than said polymer forming gas. The closest cited prior art of Kashimizu et al (US 5,980,767) discloses that the CF₄/fluorocarbon gas/polymer forming gas (col 41, lines 26-27)/first gas is always at an equal or higher concentration than the CHF₃/hydrofluorocarbon gas/etchant gas (col 16, lines 38-46)

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while the gas is pulsed (fig. 51). Regarding claim 45, the applicants have presented a persuasive argument (page 6 of the appealed brief) that the cited prior art of record fails to disclose a method to provide increased gas flow rate tolerance while etching "wherein the pulsing enables the selection of the flow rate from within a second process window that is larger than the first process window while still providing the desired etch profile in the microelectronics substrate". The closest cited prior art of Kashimizu et al (US 5,980,767) discloses the pulsing enables the selection of the flow rate from high to low value/within one process window (fig. 52).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471. The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to be 'LV' followed by a stylized flourish.

LV
February 4, 2004